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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/587,362	09/28/2006	Klaus Endres	P30186	8426
7055 7590 08/30/2010 GREENBLUM & BERNSTEIN, P.L.C. 1950 ROLAND CLARKE PLACE RESTON, VA 20191				
EXAMINER LI AIQUN				
ART UNIT 1796		PAPER NUMBER		
NOTIFICATION DATE 08/30/2010		DELIVERY MODE ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/587,362

Applicant(s)

ENDRES ET AL.

Examiner

AIQUN LI

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 July 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 11-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 11-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/CD)
Paper No(s)/Mail Date 7/19/2010
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 19 July 2010 has been entered.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Response to Amendment and Arguments

3. Applicant's arguments filed on 19 July 2010 and 23 March 2010 have been fully considered but they are not persuasive.

Applicant argues that the basic binder component of the nanocomposite of US Patent 6287639 B1 (Schmidt'639) is the "colloidal inorganic particle" which plays a crucial role in the actual bonding. However, this does not contradict with the binding/consolidating function of the silane component.

Applicant further argues in the Reply Brief filed 23 March 2010 that Schmidt'639 and US Patent 6378599 B1 (Schmidt '599) contain colloidal particles that are inseparably linked to the silanes. Both Schmidt'639 and Schmidt '599 expressly disclose that "the silanes of the general formula (I)...may

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be employed wholly or partially in the form of precondensates...either alone or in a mixture with other hydrolysable compounds" and "Such oligomers, preferably soluble in the reaction medium..." (Schmidt'639, col.3, line 55-65; Schmidt'599, col.2, line 56-65), therefore the examiner maintains that both Schmidt'639 and Schmidt '599 anticipates the instantly claimed particle-free silane composition.

Further, as indicated in the advisory action dated 23 September 2009, the recitation "consolidation" in claim 11 occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

Applicant's other arguments set forth in the Reply Brief filed 23 March 2010 have been treated previously in the examiner's answer and the examiner maintains previous position.

4. Additionally, a new ground of rejection has been made in view of the information disclose statement filed on 19 July 2010.

Double Patenting

5. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as

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to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

6. **Claims 11, 17-24 and 28-30** are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over

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claims 22, 25, 26, 31-32, 34, 36-37, 48 and 50 copending Application No. 11721203 (hereinafter '203). Although the conflicting claims are not identical, they are not patentably distinct from each other. For example, claims 11, 17-24 of the instant application recites the same composition limitation of copending claims 22, 25, 26, 31-34, 48 and 50 while the copending application differs in specifying a process of use the composition; claims 28-30 of the instant application recites the same process of consolidating a geological formation as the copending claims 22 and 36-37 while the copending claims differ in specifying elevated temperature and pressure.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 102

7. **Claims 11-27** stand rejected 35 U.S.C. 102(b) as being anticipated by US Patent 6287639 B1 (Schmidt 639), as evidenced in the MSDS data sheet of Sigma-Aldrich.

Regarding claims 11-16, Schmidt 639 teaches a composition comprising one or more silanes of the general formula of (I) R_xSiA_{4-x} (col. 1, line 9-18) for molded articles (Examples 3, 6, 7, 12) and consolidating (col. 5, line 33) substrate comprising at least one of porous materials such as sand and clay (col. 2, line 11-13), wherein the radicals R independently represent non-hydrolysable groups (col. 1, line 13-15) including one or more radicals selected from C₁₋₄ alkyl

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groups such as methyl and ethyl (col. 2, line 59) and aryl groups (col. 2, line 62) such as phenyl (col. 2, line 63); the radicals A independently represent hydrolysable groups or hydroxyl groups (col. 1, line 12-14) including one or more radicals selected from halogen (col. 2, line 35), alkoxy in particular C₂₋₄ alkoxy groups (col. 2, line 36) and acyloxy (col. 2, line 39) groups, x is 0,1,2 or 3, and $x \geq 1$ in at least 50 mol % of the silane.

Regarding claims 17-18, Schmidt 639 further exemplifies the silanes as phenyltriethoxysilane and tetraethoxysilane (col.5, line 50-55), both are liquid as evidenced in MSDS data sheet of Sigma-Aldrich, and methyltriethoxysilane (col.3, line 29-30, and Example 1), or mixtures of methyltriethoxysilane and tetraethoxysilane (col.3, line 15-20, 29-30 and 55-65; col.5, line 50-55 and Example 1), which meets the limitation "at least one of a hydrolysate and a precondensate.." of claims 17 and 18.

Regarding claims 19-24, Schmidt 639 further specifically discloses that the silanes may be employed wholly or partially in the form of precondensates either alone or in a mixture with other hydrolysable compounds (col. 3, line 56-60), and the oligomers are preferably soluble in the reaction medium (col. 3, line 56-60), wherein the hydrolysis and condensation (col.3, line 66-68) may be prepared in the presence of additives (col. 2, line 23-24, and claim 6) such as metal alkoxides (col. 4, line 19-20 and claim 7, "curing catalyst"), selected from aluminum alkoxides, titanium alkoxides or zirconium alkoxides (col. 4, line 21-22), or sodium methoxide or potassium acetate (col. 4, line 26). Schmidt 639 further discloses the hydrolysis and condensation is carried out under a sol-gel process

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(col. 2, line 24-25 and col.4, line 29-30) using a substoichiometric amount of water relative to hydrolysable radicals (claim 1(1) and col.3, line 66-67, col.4, line 1-5) to produce a solution comprising the silanes (col. 1, line 21 and col. 4, line 32 "a viscous sol").

Regarding claims 25-27, Schmidt 639 further teaches a process for preparing a consolidated molded article (col. 5, line 37, and Examples 3, 6, 7, 12) comprises mixing an inorganic compound (col. 4, line 65, col. 2, line 11-13, "sands and clays" and Example 12) with the silane (col. 4, line 65-66) and thereafter curing the silane composition (Examples 1-4). Schmidt further discloses that prior to being combined with the material the silane is activated by adding water (col. 4, line 61-62).

8. **Claims 11, 17 and 18** stand rejected 35 U.S.C. 102(b) as being anticipated by US Patent 6378599 B1 (Schmidt 599), as evidenced in the MSDS data sheet of Sigma-Aldrich.

Schmidt 599 teaches a composition (col.1, line 4) for molded articles (col. 3, line 56) and consolidating sands (Examples 1,2) comprises one or more silanes of formula(I) R_xSiA_{4-x} (col. 1, line 8-10), wherein the radicals R independently represent non-hydrolysable groups (col.1, line 13-15), the radicals A independently represent hydrolysable groups or hydroxyl groups (col.1 , line 11-13) , x is 0,1,2 or 3, and $x \geq 1$ in at least 50 mol % of the silane. Schmidt 599 further teaches the silanes may be employed wholly or partially in the form of precondensates either alone or in a mixture with other hydrolysable compounds

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(col.2, line 56-60), and the oligomers are preferably soluble in the reaction medium (col. 2, line 56-60); and exemplifies the silanes as phenyltriethoxysilane and tetraethoxysilane (col.4, line 25-30), both are liquid as evidenced in MSDS data sheet of Sigma-Aldrich, and methyltriethoxysilane (Example 1).

9. **Claims 11-15 and 17-27 are rejected** under 35 U.S.C. 102(b) as being anticipated by US Patent 4746366 (Philipp), which is disclosed in the information disclosure statement filed 19 July 2010.

Regarding claims 11-15 and 17-18, Philipp teaches a composition with a liquid consistency (col.4, line 30-35), which meets the limitation of particle-free, comprises hydrolytic precondensation (col.1, line 25-26) of at least one of organofunctional silane of the formula



wherein R' denotes alkyl or alkenyl, X denotes hydrogen, halogen, hydroxyl, alkoxy, acyloxy, n having the value of 0,1,2,or 3, m+n having the value of 1,2, or 3 (col.1, line 35-50), which meets the limitation of formula (I) when n have the value of 0.

Philipp further teach that the alkyl radicals are preferably with 1 to 4 carbon atoms such as methyl, ethyl etc., the alkoxy radicals are methoxy, ethoxy, propoxy and butoxy etc. (col.2, line 11-16), and exemplifies the silanes

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as $\text{CH}_3\text{-Si-Cl}_3$, $\text{CH}_3\text{-Si-(OC}_2\text{H}_5)_3$, which is methyltriethoxysilane, and $(\text{C}_2\text{H}_5)_2\text{-Si-(OC}_2\text{H}_5)_2$ (col.2, line 50-65).

Regarding claims 19-24, Philipp teaches the hydrolytic precondensation is prepared in the presence of at least one titanium or zirconium compound soluble in the reaction medium of the formula MR_4 , wherein R is halogen, hydroxyl, alkoxy, acyloxy (col.1, line 26-35), exemplified as $\text{Ti(O-i-C}_3\text{H}_7)_4$ and $\text{Zr (OC}_4\text{H}_9)_4$ (col.2, line 37-45), and the starting components are precondensated with sub-stoichiometric amount of water (col.3, line 45-50) in the presence of soluble oxides derived from Na, K, Mg, Ca, B, AL, Sn, V etc. (col.3, line 18-25). Philipp further exemplified the resulting composition as a clear viscous solution (Examples 1-3 and 5-7), which meets the limitation of particle-free.

Regarding claims 25-27, Philipp teaches a process comprising coating a substrate including ceramic, glass and wood (col.5, line 10-15) with the precondensate composition and hardening the coating thereafter (col.5, line 25 and Examples), wherein water is added prior to immersion of the substrate (Example 1, 3 and 4).

10. **Claims 11-25 and 27** are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent 5766680 (Schmidt'680), which is disclosed in the information disclosure statement filed 19 July 2010.

Regarding claims 11-16 and 19-22, Schmidt'680 teaches a structured composition obtained by hydrolysis and polycondensation of at least one hydrolysable silane of formula SiX_4 and at least one organosilane of formula

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$R^1_a R^2_b SiX_{(4-a-b)}$ (claim 1), wherein R^1 is a non-hydrolysable radical including alkyl such as methyl, ethyl, n-propyl, n-butyl and aryl such as phenyl (col.2, line 28-35), X is halogen, alkoxy such as methoxy, ethoxy, propoxy and butoxy (col.2, line 16-23), a and b have a value of 0, 1, 2 or 3, and the sum (a+b) have a value of 1, 2 or 3 (col.1, line 25-30 and claim 1), which meets formula (I) when b is 0, and optionally one or more soluble compounds of glass or ceramic-forming elements (col.1, line 10-35 and col.2, line 61-65) such as compounds (halides, alkoxides etc.) of sodium, potassium, boron, aluminum, titanium, zinc or vanadium (col.2, line 62-67).

Schmidt'680 further discloses that the starting components are soluble in the liquid reaction medium (col.3, line 4-8), which meets the limitation of particle-free.

Regarding claims 17-18, Schmidt'680 further exemplifies SiX_4 as tetraethoxysilane (col.2, line 50-53 and Example 1), organosilane as methyltriethoxysilane (Example 1), and a mixture of methyltriethoxysilane and tetraethoxysilane (Example 1).

Regarding claims 23-24, Schmidt'680 teaches the hydrolysis and polycondensation are effected under sol-gel process (col.3, line 10-15), and exemplifies a reaction mixture of 1.4 ml hydrochloric acid with 160 ml methyltriethoxysilane (0.8mol) and 48 ml tetraethoxysilane (0.2 mole) (Example 1), which meets the limitation of using substoichiometric amount of water since at least 29 ml of water would be required stoichiometrically calculated by the examiner.

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Regarding claims 25 and 27, Schmidt'680 teaches a process comprising coating a substrate including ceramics (col.4,line 30-35).

Claim Rejections - 35 USC § 103

11. **Claims 28- 30** stand rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 6513592 B2 (Espin) in view of Schmidt 639 as evidenced in the MSDS data sheet of Sigma-Aldrich.

Espin teaches a process for consolidating sand formations (Espin, claim1) comprises injecting a consolidation system into the formation (Espin, col.2, line 47-48, and claim 1) and curing thereof (Espin , col. 3, line 30), wherein the consolidation system comprising an organic component which allows for polymerization bonding of the sand grains (col.3, line 12-16).

Espin'592 does not expressly disclose the component, but teaches the component is exemplified in PCT/EP97/06370 (Espin, col. 3, line 11-19), of which Schmidt'639 is the English equivalent, which teaches the agent as claimed in claim 11 as detailed above.

At the time of the invention it would have been obvious for a person of ordinary skill in the art to inject the agent of Schmidt 639 into the formation and curing thereof for the benefit of consolidating sand formations, because Espin expressly teaches the use of the composition of PCT/EP97/06370 (Espin, col. 3, line 18-19), of which Schmidt 639 is the English equivalent. While teaching a particle modified by silanes, the silanes of Schmidt'639 itself is particle-free (as

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detailed above) and function as a surface modifying and bonding agent (Espin, col.3, line 13-16 and Schmidt, col. 1, line 5-15) .

Espin further teaches the formation is a sand formation bearing hydrocarbon (Espin, col. 2, line 22-23), and the process for consolidating a sand formation comprise introducing nanoparticles comprising an inorganic component and silanes (Espin, col.3, line 8, 16) into channels (Espin, col. 3, line 39-42, "between grains" and "capillary forces", and Figure 2).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AIQUN LI whose telephone number is (571)270-7736. The examiner can normally be reached on Monday -Thursday, 9:30 am - 6:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Milton Cano can be reached on (571)2721398. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/A. L./
Examiner, Art Unit 1796

/Timothy J. Kugel/
Primary Examiner, Art Unit 1796